- claim 3 as being unpatentable over Utsumi et al. (Utsumi);
- claims 4-6 as being unpatentable over Utsumi in view of Shimizu;
- claim 7 as being unpatentable over Utsumi in view of Yamahara et al. (Yamahara); and
- claims 8-15 as being unpatentable over Utsumi and Yamahara and further in view of Wada et al. (Wada).

Applicants thank the Examiner for telephoning Applicants' representative and conducting a very productive telephonic interview on June 9, 2003. During the interview, the Examiner reiterated that, in the Examiner's opinion, one skilled in the art would have been motivated to combine and modify the cited references to achieve Applicant's claimed invention for the reasons set forth in the Office Action.

In reply, Applicants' representative contended that the actual disclosures of the cited references, when each reference is examined as a whole, do not support the Examiner's conclusion, and that the only disclosure which teaches Applicant's claimed invention is Applicants' own specification.

At the conclusion of the interview, the Examiner agreed to re-evaluate his position if Applicant submitted the arguments presented during the interview in a formal written reply to the final Office Action. The following arguments are in reply to the Examiner's request, and constitute the substance of the arguments presented during the June 9, 2003 interview with the Examiner.

With regard to claim 1, Oh-e and Shimizu have nothing to do with the level of driving voltages applied to pixel electrodes, accordingly, the discussion during the interview focussed on the Ogawa references. The Examiner alleges that, since Ogawa discloses that "in the relatively thick cells, ... there is an undesirable phenomenon that the transmittance decreases as impressed voltage increases around the threshold voltage V_{th}" (Id., col. 7, lines 32-37), one skilled in the art would be motivated to modify the combined teachings of Oh-e and Shimizu to apply larger voltage to each of the pixels for the color layers with thinner liquid crystal layer, as required by Applicants' claim 1.

As explained during the interview, Ogawa reference must be examined for what it teaches as a whole. The Examiner cannot pick and choose isolated statements in a reference to supply piece-meal the elements recited in Applicants' claim 1. In this regard, the Examiner's conclusion does not find any basis in Ogawa's actual disclosure when examined as a whole.

Ogawa describes the general principle of transmittance being a function of the wavelength and applied voltage, and provides a structure wherein "undesired wavelength-dependency of the transmittance is eliminated" (*Id.*, col. 7, lines 54-61 and col. 8, lines 2-7), Ogawa does not disclose or suggest an active matrix liquid crystal display panel configured for applying different driving voltages to the pixel electrodes, depending upon the different thickness of the crystal layers in each of the color layers, as required by Applicants' claim 1.

In fact, Ogawa discloses nothing more than a color liquid crystal display apparatus, modified to eliminate wavelength-dependency of the transmittance, wherein the same driving

voltage is applied to all pixel electrodes irrespective of the thickness of the crystal layer (*see e.g.*, *Id.*, col. 7, lines 10-27). The Examiner alleged that Ogawa discloses varying the level of the applied driving voltage because it discloses experimental data as a function of varying "impressed voltage". This allegation is not supported by Ogawa's actual disclosure.

Ogawa does not disclose or suggest anything other than conventional application of appropriate voltage above the threshold value V_{th} to electrodes 5a and 5b (see Ogawa, col. 2, lines 58-67, Fig. 4; and col. 6, lines 48-57). That is, Ogawa applies the same voltage value, via electrodes 5a and 5b (*see Id.*, Figs. 15, 16, 19-22, 27 and 28) to all three electrodes corresponding to R,G,B. On the other hand, Ogawa's Figs. 9(a) and (b) show the wavelength dependency of the transmission for a constant gap (5.7 μm) with voltage being varied (0V-4V). Therefore, Ogawa does not teach or suggest that the driving voltage should be varied when the gaps are changed for Red, Green and Blue. Further, as disclosed in Ogawa's column 7, lines 42-61, because of the multi-gaps, the Voltage-Transmittance curve for each of the wavelengths tends to be uniform as shown in Ogawa's Fig. 11. Accordingly, when the multi-gaps are applied to Twisted Nematic mode, it is completely useless to change the voltage for R, G and B (Red, Green, and Blue) respectively.

On the other hand, as explained in Applicants' specification, when the multi-gaps are applied to In Plane Switching mode, a driving voltage becomes generally larger, inversely proportional to the gaps. Therefore, in the case of In Plane Switching mode, it is necessary to increase the driving voltage correspondingly to the gap.

That is, when multi-gaps are applied to Twisted Nematic mode, driving voltage tends to shift so that driving voltages for R, G, B become equal to one another. Therefore, it is useless to use different voltages for maximum brightness for R, G, B.

Only when the multi-gaps are applied to In Plain Switching mode, the driving voltage become largerly inversely proportional to the gaps.

Thus, contrary to the Examiner's analysis, Ogawa does not disclose, and is incapable of suggesting, applying different driving voltages to pixel electrodes depending upon the different thickness layers in each of the color layers, let alone applying larger voltage to each of the pixel electrodes for the color layer with thinner liquid crystal, as required by Applicants' claim 1.

Accordingly, Applicants' independent claim 1, as well as its dependent claim 2 (which incorporates all the novel and unobvious features of its base claim 1), would not have been obvious from any reasonable combination of Oh-e, Shimizu and Ogawa.

With regard to claim 3, as discussed during the interview, Utsumi does not disclose different distances between pixel electrode and common electrode for different color filters. Instead, Utsumi discloses that "[i]n order to suppress the sudden decrease of the transmittance at the short wavelength region, it is effective to shift the peak wavelength to the short wavelength side by setting a wavelength λ to be shorter than 550nm under the condition $d_{eff}\Delta n(\lambda)=\lambda/2$ [where d_{eff} is thickness of the crystal layer]" (*Id.*, col. 5, lines 56-60). Nowhere does Utsumi disclose, teach or suggest spacing pixel electrodes and opposing electrodes by distances which

are different for individual color layers, as required by Applicants' claim 3. The Examiner takes the position that in Utsumi pixel electrodes and corresponding opposing electrodes are arranged at different distances due to varying thickness of the corresponding color filters R,G,B. However, considering Utsumi's disclosure as a whole, nowhere (including col. 4, line 44 through col. 5, line 67 cited by the Examiner) does Utsumi disclose or suggest that the spacing between the pixel electrodes and opposing electrodes has any relation to the thickness of color filters corresponding to the pixel electrodes. On the contrary, in every cross-sectional view which illustrates pixel electrodes and corresponding common (opposing) electrodes, Utsumi shows pixel electrodes and common electrodes arranged at identical distances from each other (see Id., Figs, 21(a) and 21(b)).

Thus, Applicant's claim 3 would not have been obvious from Utsumi at least for this reason.

With regard to claims 5, the Examiner alleges that, since Shimizu discloses that the thickness of the liquid crystal layer increases in proportion to the wavelength of the corresponding color filter, it would have been obvious to form a liquid crystal display panel wherein the liquid crystal layer has a thickness which is increased in proportion to one wavelength selected from a wavelength region in which transmission factors of the color layer are higher than 70% of those at peaks of transmission spectra of the color layer, as required by Applicants' claim 5. During the interview, the Examiner indicate that this conclusion is based on

the Examiner taking official notice that Shimizu's color filters must be such that they are able to pass 70% or more of peak of the incoming light.

However, as explained during the interview, the Examiner's position has no basis in Shimizu's actual disclosure which does not even mention how the transmission factors of its color filters relate to peaks of transmission spectra of the color layer, let alone teach or suggest the 70% requirement as recited in claim 5. Accordingly, the Examiner is requested to provide concrete basis for his Official Notice or withdraw the rejection of claim 5.

With regard to Applicants' claim 7, one of the features of the embodiment of Applicants' invention as claimed therein, is:

> an optical compensation layer having a negative refractive index anisotropy in a one axis direction, a projection of the anisotropic axis of said optical compensation layer on a plane of one of said substrates being parallel to at least one of polarization axes of said two polarizing plates, said optical compensation layer being disposed at least between the one transparent insulating substrate and a corresponding one of said polarizing plates (claim 7).

The Examiner acknowledges that Utsumi does not disclose such a feature and relies on Yamahara to supply this acknowledged deficiency. In particular, Yamahara discloses a "phase difference plate negative in the refractive index anisotropy, with the principal refractive indices in the relation of nz=nc<nb" (*Id.*, col. 5, lines 29-31; see Fig. 1), arranged such that "the principal refractive index nb is inclined in the direction of arrow 20 at an angle θ around the y-axis about the normal direction of the surface (the z-axis in Fig. 1)" (*Id.*, col. 7, lines 22-25). Citing Fig. 4, the Examiner alleges that in Yamahara the axis of compensation layer (1) is parallel to the

polarization axes of the polarizing plates (4) (see Office Action,. Paper No. 17, page 12, lines 1-2). However, like Fig. 1, Yamahara's Fig. 4 shows only that "the fast direction 25 which is the direction of the minimum principal refractive index na of the phase difference plate 1 [is] set to be parallel to [the transmission axis of polarizer 4]" (*see Id.* col. 7, lines 50-61, emphasis added).

That is, Yamahara does not disclose or suggest that its difference plate 1 has a negative refractive index anisotropy in any of its axis directions, and therefore, is incapable of disclosing or suggesting an arrangement wherein the projection of the direction of the axis having a negative index anisotropy is parallel to the polarization axis of either of its polarizers 3 or 4. The Examiner's allegation that Yamahara's phase difference plate 1 has a negative refractive index is not supported by Yamahara's actual disclosure, nor does the Examiner explain how (or why) such a feature would have been taught or suggested by Yamahara.

Likewise, Wada does not disclose or suggest "an optical compensation layer having a negative refractive index anisotropy in a one axis direction, a projection of the anisotropic axis of said optical compensation layer on a plane of one of said substrates being parallel to at least one of polarization axes of said two polarizing plates", as required by Applicants' claim 7. (see Wada, col. 5, line 48 through col. 6, line 25; see also Fig. 8).

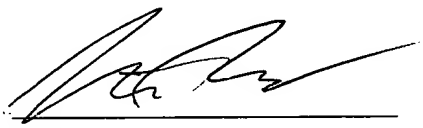
In summary, for the reasons set forth above, the Examiner's prior art rejections should be withdrawn.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Stan Torgovitsky
Registration No. 43,958

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373
PATENT TRADEMARK OFFICE

Date: July 22, 2003